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## Canadian Patents Database

(12) **Patent:**

(11) **CA 305053**

(54) **WATER HEATING SYSTEM**

(54) **SYSTEME DE CHAUFFAGE D'EAU**

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ABSTRACT:

CLAIMS:

\*\*\* Note: Data on abstracts and claims is shown in the official language in which it was submitted.

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(71) Applicants (Country):

(74) Agent:

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Important Notices

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This invention relates to improvements in water heating systems and particularly to a system and apparatus wherein a small flame or other source of heat is used to gradually heat a large body of water which is stored for use in the system.

An object of the invention is to devise apparatus wherein the heating takes place in two or more distinct zones or chambers which communicate with each other, but which do not provide for the continuous circulation of fluid from one chamber to another.

A further object of the invention is to devise a water heating system in which a large body of water is gradually heated by conduction of heat imparted by a flue and also by absorption of heat from fluid supplied from an adjacent container.

A still further object of the invention is to devise means to trap any water of condensation and effect its removal.

According to the invention the main body of water is contained in a tank which is suitably protected by heat insulating material and preferably disposed in an elevated position from which the supply of heated water may take place by gravity, although in some cases, pressure may be applied to force the water to higher levels.

In a preferred construction a water chamber in the nature of a water jacketed flue is disposed beneath the said tank. This may also be protected by heat insulating material. The flue contains at its lower end a source of heat, preferably a small gas jet, although in some cases an electric heating element may be used.

The flue of the heating chamber extends upwards and is connected to a flue disposed within the water space of the tank containing the main body of water, the outlet of the

flue being disposed above the surface of the water. But if desired the two flues may be formed integral or may be brazed or welded together.

The flue in the tank may be of ciled or zig zag formation or be otherwise disposed so that it tends to retard the passage of the flue gases until practically all of the heat has been conducted to the water in the tank.

The flue or the portion of the flue which is surrounded by the water chamber imparts heat, by induction, to the water in said chamber and owing to the fact that this chamber is nearer to the source of heat and has less water therein than the tank, the water in the said chamber will reach a higher temperature than the main body of water.

The water chamber and the tank are connected by a single pipe which is the only means of communication between the said tank and chamber. This pipe extends from the top or near the top of the water chamber to the lower portion or bottom of the tank, beneath the water therein, so that heated fluid rising from the water chamber enters the main body of water and imparts heat thereto by absorption.

The water in the tank may be replenished from a service pipe controlled by a ball float valve; and the heated water is preferably withdrawn from the pipe connecting the tank with the water chamber, but it may be withdrawn from the tank and/or the water chamber.

In order to eliminate the objectionable effects of any water of condensation which may be formed, I insert a trap in the water jacketed flue. This trap consists of a suitable threaded nut extending into the upper end of said flue, and provided with an inwardly and upwardly extending ledge or flange to catch any water condensed. A suitable U shaped outlet pipe may be provided to lead such condensed water away from the apparatus.

But in order that the invention may be more readily understood, reference will now be made to the accompanying drawings wherein,

Figure 1 is a perspective view of the heating system partly in section and showing the flue leading to the water tank.

Figure 2 is a part sectional elevation on an enlarged scale showing the connection between the water heating chamber and the water tank.

The water tank 3 for holding the main body of water is suitably protected by heat insulating material 4 and is disposed above the water heating chamber 5. A float controlled valve 6 is provided to replenish the water in the tank 3, and supply being conducted through a pipe 7 to a position adjacent to the inlet pipe 8 from the water chamber 5.

The water chamber 5 is protected by insulating material 9 and has a flue 10 which is expanded at its lower end and has disposed therein a small gas burner 11.

The flue 10 of the heating chamber 5 extends upwards and is connected to a flue 12 disposed within the water space of the tank 3, the outlet of the flue being disposed above the surface of the water. The flues 10 and 12 are shown connected by a union nut 13 but may be connected by a brazed or welded joint.

The flue 12 is preferably coiled or of zig zag formation and tends to retard the passage of the flue gases until their heat has been conducted to the water in the tank 3.

The flue 10 imparts heat to the water in the water chamber 5 by conduction, and owing to the fact that this water chamber 5 is nearer to the source of heat, and has less water therein than the water tank 3, the water in the said chamber 5 will reach a higher temperature than the main body of water.

Only one passage is provided to connect the water chamber 5 with the water tank 3, communication being effected by the pipe 14, union 15 and the inlet pipe 8. A T-piece 16 is provided to draw off the main body of water from the tank 3

a tap 17 is provided to draw off water at a higher  
AND  
temperature from the water chamber 5.

It will be observed that as only one passage is provided between the tank 3 and the chamber 5, the ordinary system of water circulation does not take place. When the water becomes heated in the chamber 5 its temperature rises, and by a series of surges it passes to the main water tank 3 wherein it imparts its heat to the main body of water by absorption. The water driven out of the chamber 5 by these surges is replaced by water from the main tank 3, the water entering the chamber 5 by way of inlet pipe 8 and pipe 14.

The upper end of the flue 10 is provided with a collar 18 which may be brazed thereto after the union nut 15 has been placed in position. The upper end of the flue 10 is of smaller diameter than the flue 12 and leaves an annular chamber 19 in which the products of condensation may be collected.

In some cases it may be possible to so proportion the communication passage and source of heat, that heat is imparted to the water in the chamber 5 at a greater rate than the rate at which the heat absorbed by the water in the chamber 5 is capable of being conducted through the water disposed in the communication passage, to the main body of water. In such a case it is possible to produce steam in the water chamber 5, which would then be used to impart heat to the main body of water in the tank 3 at a considerably higher temperature, and obtain an interchange of water between the two bodies of water intermittently.

What I do claim as my invention, and desire to secure by letters patent is;-

1. A domestic water heater of the kind described, comprising a water heating chamber having a vertically positioned flue, a water tank disposed above the water heating chamber, and a single passage through which heated water is discharged from the heating chamber into the water tank, said passage also serving as a means whereby the space formerly occupied by the said heated water is filled by water from the water tank.

2. A domestic water heater of the kind described, comprising a water heating chamber having a vertically positioned flue disposed centrally therein, a water tank disposed above the water heating chamber a flue disposed in said tank, means for connecting the said flues, and a single passage through which heated water is discharged from the heating chamber into the water tank, said passage also serving as a means whereby the space formerly occupied by the said heated water is filled by water from the water tank.

3. A domestic water heater of the kind described, comprising a water heating chamber having a vertically positioned flue, a water tank disposed above the water heating chamber, a flue disposed in coiled or zig zag formation in the water tank, said flue being open to the atmosphere at its upper end and connected at its lower end to the vertically positioned flue, and a single passage through which heated water is discharged from the heating chamber into the water tank, said passage also serving as a means whereby the space formerly occupied by the said heated water is filled by water from the water tank.

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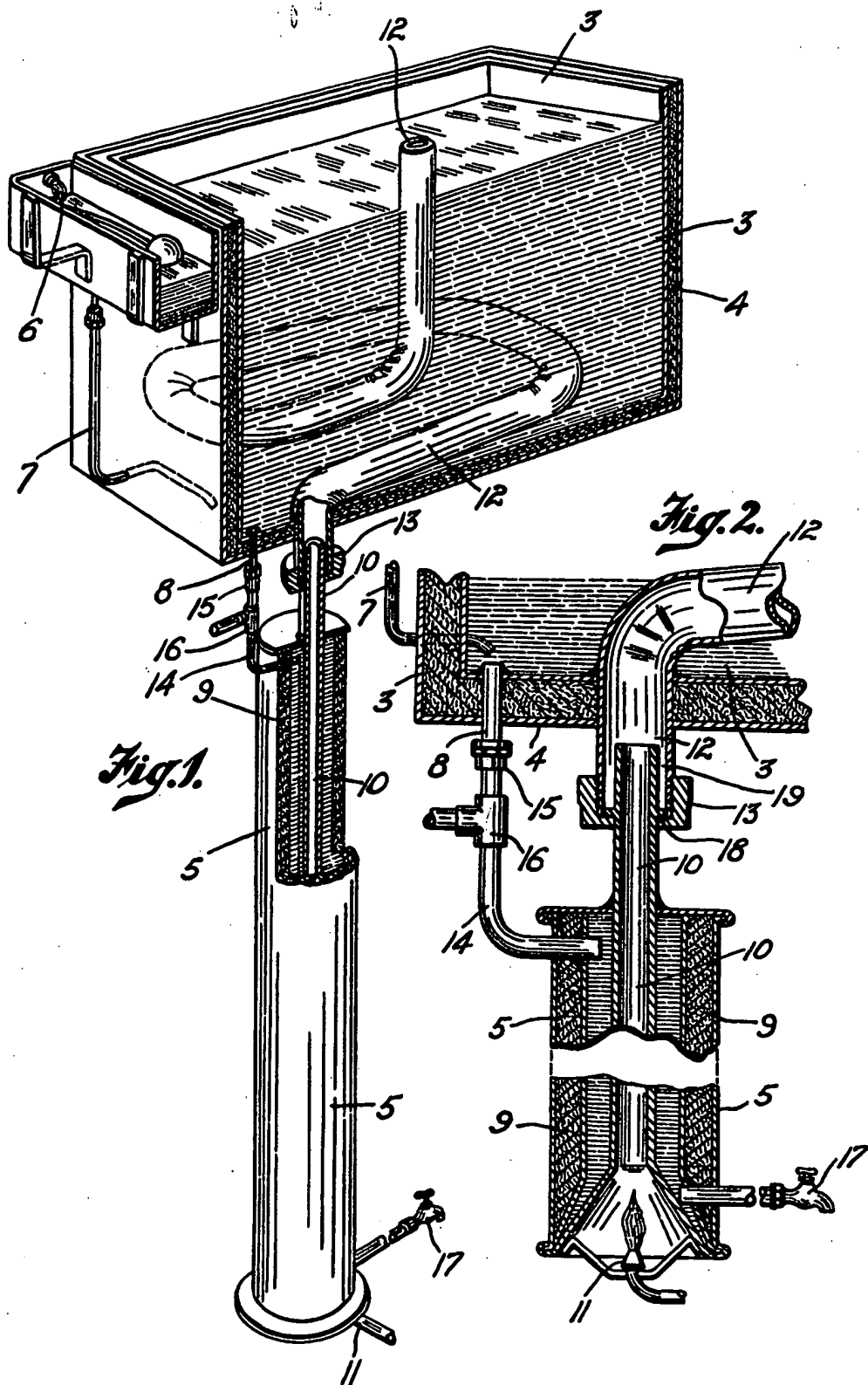
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4. A domestic water heater of the kind described, comprising a water heating chamber having a vertically positioned flue, a small gas burner disposed in the lower end of the flue whereby heat may be imparted through the flue to the water in the heating chamber, a water tank disposed above the water heating chamber, a flue disposed in coiled or zig zag formation in the water tank, said flue being open to the atmosphere at its upper end and connected at its lower end to the vertically positioned flue, and a single passage through which heated water is discharged from the heating chamber into the water tank, said passage also serving as a means whereby the space formerly occupied by the said heated water is filled by water from the water tank.

5. A domestic water heater of the kind described comprising a water heating chamber having a vertically positioned flue, a water tank disposed above the water heating chamber, a flue disposed in coiled or zig zag formation in the water tank, said flue being open to the atmosphere at its upper end and connected at its lower end to the vertically positioned flue, and a single passage through which water is caused to surge when heated by a small gas burner disposed in the lower end of the vertically positioned flue.

Signed at Sydney, in the State of New South Wales,  
Commonwealth of Australia, this 3<sup>rd</sup> day of  
December, 1929.

*William Henry Gregory Peake*





THIS IS TO BE THE DRAWING REFERRED TO  
IN THE SPECIFICATIONS HEREUNTO ANNEXED.

WITNESSES  
Jan. 23 1930

INVENTOR  
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